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Technical Report 5-20237 & 5-20238  
Contract No. DAAH01-98-D-R001  
Delivery Order No. 17

**Investigate DMSMS Impact on Selected Spare Parts**

(5-20237 & 5-20238)

Final Technical Report for Period  
4 August 98 through 30 April 1999

August 1999

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Prepared for:

U.S. Army Aviation & Missile Command  
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## PREFACE


This technical report was prepared by the staff of the Research Institute, The University of Alabama in Huntsville. The purpose of this report is to provide documentation of the work performed and results obtained under Delivery Order 17 of AMCOM Contract No. DAAH01-98-D-R001. Mr. Gary Maddux was the principal investigator. Mr. Dan Frey, Industrial Operations Division, Systems Engineering and Production Directorate, Research, Development, and Engineering Center, U.S. Army Aviation & Missile Command, provided technical coordination.

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Prepared for: Commander  
U.S. Army Aviation & Missile Command  
Redstone Arsenal, AL 35898

I have reviewed this report, dated August 1999 and the report contains no classified information.

  
\_\_\_\_\_  
Principal Investigator

## TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	OBJECTIVES .....	1
3.0	STATEMENT OF WORK .....	1
4.0	ANALYSIS OF DMSMS IMPACTS .....	2
5.0	CONCLUSIONS AND RECOMMENDATIONS .....	2

## **1.0 Introduction**

The Industrial Operations Division (IOD), SEPD, RDEC, AMCOM has the mission to establish processes for identifying and resolving the problems associated with Diminishing Manufacturing Sources and Material Shortages (DMSMS). The objective of the DMSMS Program is to support readiness by minimizing obsolescence/nonavailability problems in Army equipment. This objective is achieved by taking proactive and reactive steps to support development and implementation of solutions that preserve readiness and support Army goals. Investigation and analysis of the impact of diminishing manufacturing sources and material shortages ensures that design changes are incorporated only after a systematic technical evaluation and review of the total cost and effect of the change is conducted. The systems engineering analysis evaluates the long-term life cycle consequences and impact on the manufacturability, maintainability and supportability of the overall weapon system.

In order to fulfill its mission, IOD required research, analysis and evaluation of diminishing manufacturing sources and material shortages in all areas related to spare parts and components. This research effort concluded with a detailed analysis of the impact on spare parts from changes due to diminishing manufacturing sources and material shortages.

## **2.0 Objective**

The objective of the work performed under this task order was to research, evaluate, investigate and analyze the impact of diminishing manufacturing sources and material shortages in all areas related to components on selected spare parts. Recommendations were presented to the Industrial Operations Division in the form of briefings, reports and other methods as required.

## **3.0 Statement of Work**

The statement of work, as outlined in delivery order 17, was as follows:

- 3.1 UAH shall study the development of a Mechanical Obsolescence/Sustainment Program for implementation by the Industrial Operations Division. UAH shall attempt to utilize the information gathered during the Tech Loop Screening Process as well as information from the Command Readiness Reviews in the formulation of this program. The program shall contain the types of problems which could be resolved, the method of resolution, funding avenues, and a cost saving/tracking process. The program should include the use of government-furnished databases and other automated tools UAH deems suitable and necessary.

- 3.2 UAH shall provide solutions for DMSMS/obsolescence problems which arise from this effort. Solutions shall be presented with sufficient documentation to justify design change considerations. UAH shall not only present solutions that are unique to the subsystem, but shall also utilize solutions that have been developed for other weapon systems within the Army and DoD when applicable.
- 3.3 UAH shall assess system impacts from DMSMS where applicable. UAH shall evaluate component substitution and redesign or other solution options for components impacted by DMSMS.
  - 3.3.1 UAH shall assess the impact of diminishing manufacturing sources on system supportability. UAH shall evaluate and develop problem resolution approaches.
    - (1) UAH shall define/refine assessment methods utilized for DMSMS affected components. Document analysis methods, data sources, criteria and reporting format.
    - (2) Identify alternate sources, part numbers and qualified substitutes for obsolete or unavailable components. Verify compliance with military and commercial standards. Recommend specific alternate and substitute parts. Propose potential approaches to resolve availability and obsolescence problems and to reduce their impacts on system supportability.
    - (3) UAH shall identify technology insertion opportunities. Identify opportunities for insertion of new technologies into systems through redesign. Identify LRUs or boards that are candidates for redesign based on their use of obsolete microelectronics.

#### **4.0 Analysis of DMSMS Impacts**

Under this task members of the UAH Systems Management and Production Lab performed a detailed engineering analysis on the impacts of DMSMS on selected component parts of several AMCOM weapon systems. For example, microelectronic components were analyzed according to their availability and expected life cycle. To ascertain this information, UAH worked with the electronics industry, AMCOM project offices, and other government agencies. UAH also worked closely with the SEPD IOD systems engineer to resolve design problems as they arose. The specific results of these task efforts were published and delivered to IOD under separate cover.

#### **5.0 Conclusion and Recommendations**

During the time frame allocated by the delivery order, members of the UAH Systems Management and Production Lab, with the cooperation of representatives from the AMCOM Systems Engineering and Production Directorate and AMCOM project offices investigated the impacts of DMSMS on mechanical and microelectronic components of several AMCOM weapon systems. Because of the rapidly changing industrial technologies, it is imperative that this assessment be refreshed on a periodic

basis. Only through the diligent monitoring of a complex system can its sustainability issues be properly addressed. It is recommended that AMCOM project offices adopt a proactive DMSMS management philosophy so that the total cost of ownership is reduced over the system's life cycle.